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This chart is an update of **Soft tissue fillers, part 1: biodegradable**, by Natalie M. Curcio, MD, MPH, originally published in 2011.



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Soft tissue fillers, part 1: biodegradable

by Stefanie Altmann, DO, and Natalie M. Curcio, MD, MPH

Hyaluronic Acid (HA) Fillers

Derived from bacterial (*Streptococcus*) fermentation
Crosslinked by BDDE (1,4-butanediol diglycidyl ether)
Premixed with 0.3% Lidocaine, except for Belotero Balance®
No skin test required

Trade name	Total HA concentration	Needle	FDA-approved indication	Notes
Belotero Balance®	22.5 mg/mL	30 G	Moderate to severe facial wrinkles and folds	• CPM® • Crosslinking rate variable • No lidocaine
Juvéderm® Ultra XC	24 mg/mL	30 G	Moderate to severe facial wrinkles and folds; Lip augmentation	• HYLACROSS™ • Crosslinking rate ~6%
Juvéderm® Ultra Plus XC	24 mg/mL	30 G	Moderate to severe facial wrinkles and folds	• HYLACROSS™ • Crosslinking rate ~8%
Juvéderm® Vobella XC	15 mg/mL	32 G	Lip augmentation; Correction of perioral rhytids	• VYCROSS™
Juvéderm® Vollure XC	17.5 mg/mL	30 G	Moderate to severe facial wrinkles and folds	• VYCROSS™
Juvéderm® Voluma XC	20 mg/mL	27 G	Midface volume loss	• VYCROSS™ • Deep injection (subcutaneous/ supraperiosteal) for cheek augmentation; not for intradermal or in lip injection
Restylane®/ Restylane®-L	20 mg/mL	30 G	Moderate to severe facial wrinkles and folds; Lip augmentation	• NASHA™ • Particle size range: 330-430 m
Restylane® Lyft	20 mg/mL	27 G or 29 G	Moderate to severe facial folds and wrinkles; Midface volume loss; Dorsal hand volume loss	• NASHA™ • Particle size range: 750-1000 m
Restylane® Silk	20 mg/mL	30 G	Lip augmentation; correction of perioral rhytids	• NASHA™ • Particle size range: 50-220 m
Restylane® Defyne	20 mg/mL	27 G	Moderate to severe facial wrinkles and folds; Lip augmentation	• XpresHAn™ • First approved in Europe under the brand name Emervel
Restylane® Refyne	20 mg/mL	30 G	Moderate to severe facial wrinkles and folds; Lip augmentation	• XpresHAn™ • First approved in Europe as brand name Emervel • Less crosslinked vs. Restylane® Defyne

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Restylane® Kysse	20 mg/mL	30 G	Lip augmentation; correction of perioral rhytids	• XpresHAn™
Revanesse® Versa™	25 mg/mL	30 G	Moderate to severe facial wrinkles and folds	• Thiofix® Technology
RHA® 2 (resilient HA)	23 mg/mL	30 G	Dynamic Moderate to severe facial wrinkles and folds	• Preserved Network® technology (PNT) • Mid to deep dermis • Less cross-linked • Teosyal RHA fillers in Europe
RHA® 3	23 mg/mL	27 G	Dynamic Moderate to severe facial wrinkles and folds	• Preserved Network® technology (PNT) • Mid to deep dermis
RHA® 4	23 mg/mL	27 G	Dynamic Moderate to severe facial wrinkles and folds	• Preserved Network® technology (PNT) • Deep dermis to superficial subcut • More cross-linked

CPM® (Cohesive Polydensified Matrix): proprietary crosslinking process using low and high molecular weight HA to produce a smooth, flexible gel

PNT (Preserved Network® Technology): Utilizes longer HA chains that are less cross-linked leading to a dynamic structure with natural viscoelastic properties

NASHA™ (nonanimal stabilized hyaluronic acid): firmer gels, used to create projection and definition.

XpresHAn™ Technology/OBT™ (Optimal Balance Technology): Uses a range of HA cross-linking and gel calibration (particle size), designed to increase softness and flexibility.

HYLACROSS™ Technology: Utilizes crosslinked high molecular weight HA

HYCROSS™ Technology: Utilizes primarily crosslinked low molecular weight HA (90%) and high molecular weight HA (10%); designed to last longer vs. earlier generation HA fillers with less swelling.

Thiofix® Technology: provides a higher rate of homogenous cross-linking using shear rate mixing and proprietary wet-milling process to produce spherical particles

Micheels, P, et al. Rheological Properties of Several Hyaluronic Acid-Based Gels: A Comparative Study. *J Drugs Dermatol.* 2018 Sep 1;17(9):948-954.

Micheels, P, et al. Effect of Different Crosslinking Technologies on Hyaluronic Acid Behavior: A Visual and Microscopic Study of Seven Hyaluronic Acid Gels. *J Drugs Dermatol.* 2016 May 1;15(5):600-6.

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Biostimulatory fillers

Synthetic source
No skin test required

Trade name	Composition	FDA-approved indication	Notes
Radiesse®/ Radiesse® Plus	Calcium hydroxylapatite (CaHA) microspheres suspended in an aqueous gel carrier Radiesse® Plus contains 0.3% lidocaine	HIV-associated lipoatrophy; Moderate to severe facial wrinkles and folds; Dorsal hand volume loss (Radiesse®)	Radio-opaque on imaging Avoid in lips
Sculptra®	Poly-L-lactic acid microparticles; reconstitute with sterile water	HIV-associated lipoatrophy; Moderate to severe facial wrinkles and folds	Massage for 5 minutes, 5x/day for 5 days Given in a series of injections over several months

Autologous fillers

Name	Composition	FDA-approved indication	Notes
Autologous fat		Does not require FDA approval if not modified	
LAVIV™ (azficel-T)	Autologous fibroblasts	Moderate to severe nasolabial fold wrinkles	Posterior auricular skin is sent to manufacturer where fibroblasts are isolated and cultured

Biodegradable fillers no longer available in the U.S.

Source	Trade Name
Autologous human collagen	Autologen®
Non-cadaveric human collagen	CosmoDerm® 1, CosmoDerm® 2, CosmoPlast®
Cadaveric human collagen	Dermalogen®, Cymetra®
Bovine-derived collagen	Zyderm® I, Zyderm® II, Zyplast®
Porcine-derived collagen	Evotence®
Porcine-derived gelatin	Fibrel®
Hyaluronic acid (from rooster comb)	Hylaform®, Hylaform Plus®
Hyaluronic acid (from Strep. equis)	Captique®, Eleveess®, Prevelle Silk®

References:

1. Bologna J, Jorizzo J, Schaffer I. Dermatology. Philadelphia: Elsevier; 2017.
2. Alikhan A, Hocker TL. Review of Dermatology. Elsevier; 2017.

Some information in this chart has been acquired from the manufacturing company's website:

Belotero (Merz) <https://www.belotero.com/>

Juvéderm (Allergan) <https://www.juvederm.com/>

Restylane (Galderma) <https://www.restylaneusa.com/>

Revanesse <https://revaneseusa.com/>

RHA Collection <https://rhacollection.com/>

Radiesse (Merz) <https://radiesse.com/>

Sculptra (Galderma) <https://www.sculptraaesthetic.com/>

LAVIV <https://www.fda.gov/media/80838/download>